Weed Watchin'

An Annual Newsletter for Volunteer Weed Watchers

Published by the New Hampshire Department of Environmental Services, Summer 2007

World of Weeds Updates

Hello Weed Watchers, Lake Hosts, and others interested in exotic aquatic plants! Welcome to the Summer 2007 edition of the *Weed Watchin'* newsletter. The following are some updates from the Exotic Species Program since our last newsletter.

Exotic Species Infestations – At the close of summer 2006, we had documented four new infestations of exotic aquatic plants in New Hampshire. Three new infestations were found by Weed Watchers (variable milfoil in Halfmoon Pond in Barnstead, variable milfoil in Great East Lake in Wakefield, and curly-leaf pondweed in Rockybound Pond in Croydon). A DES intern also found variable milfoil in Lake Pemigewasset in New Hampton. The good news is that three of these four infestations are under control, and one of them is even gone, thanks to the quick reporting of these infestations by our Weed Watchers. Unfortunately, the infestation of variable milfoil in Lake Pemigewasset was left unreported for too long, and nearly a half of that lake is currently infested and in need of more intensive management practices. Early detection is crucial!

Inside

Exotic Species Rules – New and expanded exotic species rules were adopted in fall 2006, further clarifying sections that pertain to grant funding, control practices, and other protocols. The best thing about the rule revisions is that more species of exotic aquatic plants are prohibited, which will help to futher prevent new infestations to New Hampshire waterbodies by reducing the number of new plants that can be brought into New Hampshire, and subsequently our waterbodies.

Control – In 2007, DES has worked with various lake associations and marinas across the state to grant up to $85,000 in matching funds for exotic aquatic plant control projects. Approximately 19 herbicide applications, 15 hand-pulling projects, one benthic barrier placement, and one suction harvesting project was conducted on exotic aquatic plants this summer.

Prevention and Research Grants – In 2007, DES is providing grants for three projects dealing with the prevention of exotic plant infestations. Grants are going to the New Hampshire Lakes Association to coordinate the Lake Host Program; to the Goose Pond Lake Association to coordinate Weed Watcher activities and plant mapping activities; and to the Sullivan County Conservation District for an education and outreach campaign along the Connecticut River. DES is also providing a research grant to the Town of Barnstead and the University of New Hampshire for a variable milfoil control project in the Suncook River in Barnstead. More grant opportunities will become available in September 2007. Watch the DES Exotic Species website at www.des.nh.gov/wmb/exoticspecies/grants for more information.

Amy P. Smagula, DES Exotic Species Program Coordinator

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Native Plant Focus

Macroalgae – *Chara* and *Nitella*

By Rebecca Lelesi, DES Program Assistant

Did you know that algae are the most primitive plants that exist in the world? They do photosynthesize (which simply means that they turn sunlight into energy), but they lack the structure that advanced plants have, like roots, leaves and flowers. Considering that algae are so primitive most of us would not know that there are three distinctly different types of algae. The first type is plankton, the microscopic green dots that float in the water — what most of us think of when we hear the word algae. Then there is filamentous algae, which forms in long stringy, hair-like strands. We usually see these forming the "green clouds" or "cotton candy" like growths on the bottom of lakes and ponds. The third type, however, is the most interesting because these attached-erect algae are the most advanced of the three groups. They even appear to be rooted on the lake bottom.

The most common types of attached-erect algae are *Nitella* (brittlewort) and *Chara* (musk grass or skunk weed). These algae are often confused with aquatic plants such as water-nymphs and coontail, but they are in fact very different. One of the differences is that *Nitella* and *Chara* have no roots. Instead of roots they have rhizoids, which are also called holdfasts. These holdfasts are made up of tiny hair-like fibers that the algae use to attach to the soil, though they can free float at times. The main difference between holdfasts and roots are that plants use their roots to absorb nutrients from the soil, whereas algal holdfasts are not used in this way, and only anchor the algae to the bottom of the lake. *Nitella* and *Chara* also pull dissolved nutrients directly from the water.

Their methods of reproduction differ somewhat from those of vascular plants. Unlike most plants, they do not use pollen to reproduce. *Nitella* and *Chara* can reproduce in two ways. They use spores, like fungus, and they can regenerate from a small fragment of the algae. Wildlife, especially waterfowl, and water currents are the main way that *Nitella* and *Chara* spread their spores and fragments from one lake to another.

Chara and *Nitella*.
Photos courtesy of Don Cameron, Maine DEC.

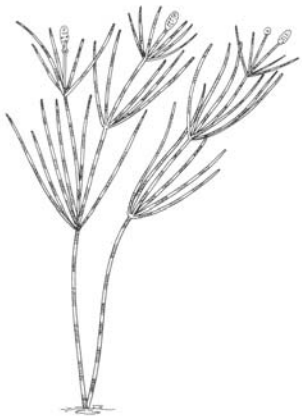
Native Plant Focus, cont.

Another way in which *Nitella* and *Chara* differ from other plants is that they can thrive in water much deeper than normal rooted plants. Although these algae tend to prefer shallow water, they have been found at depths up to 20 meters, particularly in clear lakes and ponds like those found in New Hampshire. *Nitella* and *Chara* can survive in deep water because they have adapted their photosynthesis to require less light than most plants need for growth.

The graphic at right shows a few characteristics that distinguish *Nitella* and *Chara* from one another, which should help you to determine if these algae are in your lake:

You may be wondering, "are *Nitella* and *Chara* good for my lake?" The answer is, yes! *Nitella* and *Chara* are very old algae found in fossil records dating back 360 to 408 million years. There are more than 30 different species of each found in the U.S., and they occur all over the world. *Nitella* and *Chara* stabilize bottom sediments, provide good cover for fish and invertebrates, are a great source of food for many species of water fowl (especially ducks), and help stabilize plant populations by crowding out less desired species such as variable milfoil.

Nitella and *Chara* are often found in clear water and will not inhabit water that is excessively nutrient-enriched. In England, *Nitella* and *Chara* are considered endangered and scientists are working hard to reestablish thriving populations of these algae.



Nitella

- Light to dark green color
- Less than 8 cm to 2 m long
- Forked bushy branches
- Soft to touch
- No odor
- Fresh water
- Prefers slightly acidic water

Chara

- Grey-green color
- 5 cm to 1 m long
- Cylindrical whorled branches
- Crunchy texture (Calcium deposits)
- Musty, garlic, or skunk like odor
- Fresh to brackish water
- Prefers slightly alkaline water

Illustrations by Brandy Penna, former DES Intern.

DES has begun training certified divers to help with milfoil eradication. See story on page 7.

EXOTIC ALGA ALERT!

Rock Snot (*Didymosphenia geminata*)

By Amy P. Smagula

Rock Snot. Now that's a species name that has a ring to it. Although there is not a great level of concern to lakes and ponds, I thought it would be useful to highlight this algae since it is the hot topic this summer in both Vermont and New Hampshire. The following is a series of commonly asked questions and answers about Rock Snot to help you identify this alga in the event that you are recreating in the Connecticut River.

Q. What is Didymo, or "Rock Snot"?

A. Didymo is the common name for *Didymosphenia geminata*, an invasive freshwater diatom species (microscopic algae). Didymo can form extensive "blooms" on the bottoms of rocky river beds, essentially smothering aquatic life forms such as macroinvertebrates (aquatic insects), native algae, and other organisms. Additionally, the physical appearance of the bloom is aesthetically unpleasing, and can reduce the recreational values of a waterbody. Didymo uses stalks to attach to rocks and plants in a river system. The diatom actually creates these stalks, which can form masses 10-12 inches thick on the river bottom, and trail for lengths of 2-3 feet in the current. It is actually these stalks that are more problematic than the algae. The algae will eventually die off and decompose, while these stalks tend to persist for several months on the river bottom.

Q. Where did it come from?

A. Didymo is generally a northern circumpolar species, found in colder, low nutrient, high clarity streams. We are noticing a shift in the habitats where Didymo can survive now, however, to include streams in warmer climates, streams with more nutrients, and streams with moderate clarities and even some tannic (tea colored) waters. Didymo is currently found in Scotland and Poland, and it is spreading throughout the U.S. northwest. It is also in Quebec and in British Columbia. New Zealand has been particularly hardest hit by the Didymo problem. We believe Didymo was introduced to this region by contaminated fishing/wading gear.

Mass of Rock Snot (Didymo) from Connecticut River. Photos courtesy of Amy P. Smagula, DES.

Q. Why is Didymo a problem?

A.Didymo will change the bottom appearance, structure, and food web of a stream. Ecologically, common macroinvertebrates found on the bottoms of well-oxygenated streams will change to more worm-like and snail populated communities. Aesthetically, the brownish-white flowing masses of the stalk structures are unpleasant to see and recreate in.

Q. What is the current distribution of it in the northeast region of the US?

A. As of right now, portions of the Connecticut River near Bloomfield, Vermont are infested, as are portions of the White River in Vermont downstream of the Stony Brook confluence. Due to the nature of spread, biologists are concerned that any areas downstream of these two rivers could eventually show growing colonies of Didymo. Reports from far northern New Hampshire, in the Connecticut Lakes Region, suggest that Didymo may be growing there as well, but these have not been confirmed at this time.

EXOTIC ALGA ALERT!, cont.

Q. What does it look like?

A. didymo is often described as looking similar to a sewage spill in a waterbody, where the toilet paper is streaming in the flow. This is the result of the stalk material becoming long and shredding at the ends, and bleaching white. These mats have a slimy appearance, but are not slimy. Over time, the bloom may take on a brownish/flocky appearance due to the fact that sediment particles may become embedded within the stalks.

Photo by Angela Shambaugh, Vermont DEC.

Q. What does it feel like?

A. Didymo feels like wet felt, wool, or cotton balls. It is hard to pull apart, and hard to remove from the substrate it has attached to. In contrast, most other algae species feel slimy and will slip through your fingers.

Q. In what types of habitats/conditions is Didymo generally found?

A. Didymo is found in river systems with stable substrates such as cobble or rock bottoms. Water conditions are usually clear, cool (optimal temperature is about 60°F), have high light penetration, and lower nutrient concentrations. Flow conditions are generally moderate to moderately fast.

Q. How is Didymo spread?

A. This algae is so small it can go unobserved when it is a single algal cell on the bottom or in the water column. Additionally, the algae can remain viable for several weeks if kept moist. Because of this, spread of the algae is unfortunately easy. Felt soled waders are often particularly to blame, since fishermen use them to gain a grip on slippery rocky bottomed areas.

The algae easily becomes attached to the felt, and if not properly cleaned or thoroughly dried before use, the diatom can spread to another waterbody. Any other recreational equipment, including bait buckets, diving gear (neoprene), water shoes/sandals, canoes, kayaks, and life jackets, to name a few.

Q. Will we ever get rid of it?

A. There is no means of "eradication" for this alga. Copper sulfate complexes can be used, but they are not 100 percent effective. Some algae will survive and float downstream and form new colonies.

Q. Can Didymo grow in lakes?

A. Yes, since Didymo is an algae, it can certainly grow in lakes, ponds, or other freshwater systems. Didymo generally will not reach bloom conditions in these types of systems, however. Didymo will mostly be a problem in river systems.

Q. What do I do if I think I saw Didymo?

A. First, consult the link on the Didymo page at www.des.nh.gov/wmb/exoticspecies that is called "How to Tell if You May Be Seeing Didymo" to determine if the specimen is worth collecting. If yes, then collect a representative sample of what you are seeing, and send it to the DES or the Vermont ANR. Addresses are listed on the identification page. Please send samples to the agency in the state where the sample was collected. Include a location description, estimate of the area that is impacted, and date/time the sample was collected. GPS coordinate are also very helpful, if you have a GPS unit handy. Samples can be folded into a business card, or placed into a jar or plastic baggie.

Got Exotic Plants?

New Management Plans Completed for 19 Waterbodies

By Amy P. Smagula

In the summer 2006 edition of *Weed Watchin'* there was an article about a new method for compiling information on waterbodies with exotic plants; it was called the Long-Term Management Plan. The purpose of these plans is to ensure that there is a structured, well-organized process that is tailored to best manage growths of aquatic vegetation on a waterbody by waterbody basis. Included in the plan is a five-year schedule for control practices that will seek to either eradicate or to control exotic aquatic plants in the subject waterbody based on feasibility and the overall goals of management.

In the last year, we have worked closely with many lake associations throughout the state to put together 19 such plans, with each tailored to the specific conditions of each waterbody. These plans laid the groundwork for management practices that began this summer; and once the waterbody specific management plans are created, they lay the groundwork for ensuring that matching funds are earmarked for lakes scheduled for controls. They will also ensure that staff biologists have time allotted to work with individual lakes, and that all available best management practices (BMPs) are being employed to reduce nuisance growths of exotic plant growth.

The Department of Environmental Services is taking the lead in drafting the management plans, but input is still needed from local lake residents and officials from the municipality. A form has been included on the DES website at www.des.nh.gov/wmb/exoticspecies/documents/data_needs_for_management_plans.pdf to help lake associations in gathering the specific information that is needed for the plans. An example of a well-prepared packet of information (from Forest Lake in Winchester) is also included on the website. This example can be found at www.des.nh.gov/wmb/exoticspecies/documents/example-info_for_management_plan-forest_lake.pdf.

If you often take the lead for organizing exotic aquatic plant management on your waterbody, please contact Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us for more information.

If you are interested in viewing examples of completed long-term management plans, please visit the DES website at www.des.nh.gov/wmb/exoticspecies/waterbodies_with_draft_management_plans.htm, and click on the name of a lake.

GADGETS

The DES Exotic Species Program is currently working on enhancing our abilities to map and to control exotic aquatic plants. Here are some new gadgets that we are currently working on developing.

Underwater Surveillance Vessel (USV) – As many Weed Watchers know, it is very hard to view plants in dark water, deeper depths, and when sunlight angles are not optimal. To work around all of these variables, DES is working with some specialists to set up an underwater surveillance vessel (USV) that will aid us in enhancing our viewing and mapping abilities. This USV will be built off from an 18-foot McKee boat, and it will have adjustable booms with lights and cameras on it to allow DES biologists to accurately map exotic plants. The USV will also be equipped with real-time GPS so that we can plot these growths. We expect this vessel to be in use by summer 2008.

Diver-Assisted Suction Harvester – DES has recently purchased a diver-assisted suction harvester device (DASH) for use in controlling exotic plants. Licensed divers under contract with DES will use the DASH to remove larger or more widespread growths of exotic plants, either as a first technique, or following an herbicide application to reduce the size of an infestation. This method involves removing the plants by the roots, and suctioning them out of the lake for disposal. We are currently field testing the device this summer, and anticipate that we will be using it on a broader basis during the summer of 2008. Use of the DASH will be built into individual long-term management plans for infested waterbodies.

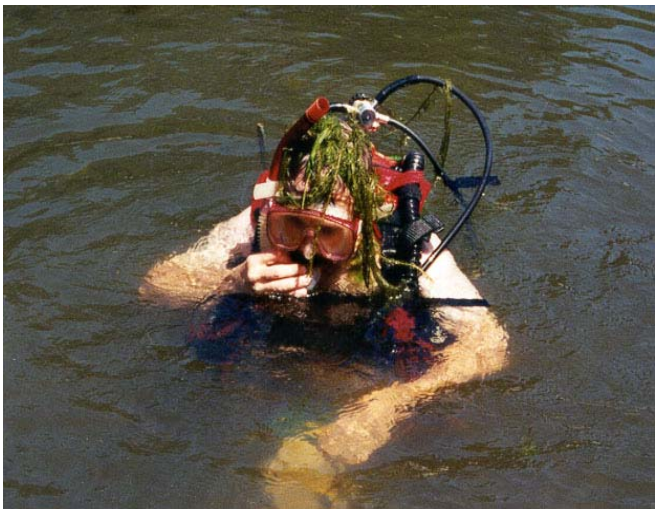
Save Our Lakes!

New Hampshire's Lakes are on Fire

By Ted Aldrich, PADI Dive Instructor, and Resident of Sand Pond, Marlow

Fire normally burns fast and has an immediate impact. The loss would be even more serious if it invaded your property, spread an inch a day and started new fires so fast you couldn't stop them. Especially if there were fewer than a dozen fire fighters in the state, no insurance to cover your losses, and little or no chance of ever putting it completely out!

Variable milfoil is at least as devastating. But far too few people understand its threat or who to call. There is no insurance, little likelihood of rebuilding clear lakes, poor chances of restoring recreational use or water quality, and damage to native life. And we lack money, manpower and public awareness. The impact of New Hampshire losing water clarity alone is estimated at $50 million in sales, $18 million in household income, and over 800 jobs. All lost!



DES biologist Walter Henderson, after a long day of hand-removing milfoil from Kimball Marine on Little Squam Lake. Photo by Amy Smagula.

What can you do?

First, become part of the early detection system that is so crucial for dealing with new infestations. We need more Weed Watchers on that front line.

Second, trust the biologists. DES would not recommend chemicals or any such assault on the environment if the situation were not serious. People against chemicals are wishing for something much worse. Hand harvesting is not enough.

Third, get involved. Educate the public (see "NH Lakes, Under Attack"), support DES efforts, sponsor a diver's certification to harvest, participate in early detection, recruit more Weed Watchers, and help with fund raising and follow-up programs.

Now, a new way to get involved has been created for certified divers. Because the crew of divers is so limited, and the demand for hand-removal of exotic plants so great, I have banded together with state biologists and other certified divers and dive instructors to put together a Weed Control Diver Course that is recognized by the Professional Association of Dive Instructors (PADI). The course is a three-day event, and is being offered for less than $150 for certification to already open water or otherwise certified divers. The course includes a classroom session on the first day, followed by a dive in a contained system (swimming pool), then an open water dive day to practice your skills on the real enemy, variable milfoil.

Anyone is invited to attend the first day of any of our Weed Control Diver classes. That first day is free to anyone concerned about the spread of exotic weeds or willing to help support diving operations to try to manage the problem.

Divers seeking certification can enroll through the New Hampshire Lakes Association webpage at www.nhlakes.org. A new class will be offered in August or September 2007.

Thank you for caring,

Ted Aldrich, Weed Control Diver

Weed Watchers in Action

GELIA Weed Watchers Identify Menace

By Bess Smith and Linda Schier, Great East Lake Improvement Association

The Great East Lake Improvement Association (GELIA) in Wakefield, N.H., and Acton, Maine, has had an active Weed Watcher program since 2001. We now have over 60 volunteers on the lake covering almost the entire 18 miles of shoreline. Each year more interested members complete the Weed Watcher training and most of our membership inspects their own waterfronts with great regularity. Variable milfoil infestations have occurred on both Belleau Lake in Wakefield and Balch Lake in Wakefield and Acton, so the threat from this invasive aquatic plant is quite imminent. Many of our boaters also visit these nearby lakes. GELIA also participates in the Lake Host program with courtesy boat inspections at the launch and in 2006 they found a fragment of Eurasian water-milfoil on a personal watercraft ready to launch.

Also in 2006, we had a scare when one of our dedicated volunteers, Carol Lafond, found something suspicious in the neighborhood of the public boat launch. Carol routinely snorkels around the launch area, and on July 11 she noticed a plant looking like a neon sign amongst the native vegetation. She took a piece and brought it to GELIA President Linda Schier. Linda and Carol then donned masks and snorkels and went back to the site. After discussing the situation with Amy Smagula of DES, Linda pulled the plant, complete with roots, while Carol held a net around it. The plant was kept in the refrigerator until meeting with Amy. Amy delivered it for DNA analysis. As we suspected, it proved to be variable milfoil (*Myriophyllum heterophyllum*). Carol has revisited the site, as well as the rest of the launch cove area, on a weekly basis and fortunately there has been no sign of regrowth. As a side note, Carol is such a dedicated Weed Watcher that she bought herself a wetsuit to continue her patrolling into the cold weather!

The above information was distributed to the GELIA membership via email and we received an outstanding response from concerned members.

Almost immediately the emails began to flow in asking for updates and reporting their own experiences. It was not uncommon to hear "I was checking before, but now I'm really going to look!" Having a true spotting of a rooted plant was a heads-up for those who thought it might not ever happen on Great East.

This story is the perfect example of how important a Weed Watcher Program can be and how successful ours is at Great East Lake. We are so pleased that the GELIA membership has risen to the challenge and continues to embrace the concept of volunteer activism to preserve the quality of life on Great East Lake for its human inhabitants as well as all the other species that require diversity and a stable ecosystem.

VOLUNTEERS NEEDED!

If you are interested in participating in the Volunteer Weed Watcher Program, or if you would like a refresher training session, please contact Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us. If you see anything even remotely suspicious, collect a representative sample of the plant (preferably with seeds or flowers), wrap it in a moist paper towel, seal it in a plastic baggie, and deliver or send it to: Amy P. Smagula, NH DES, 29 Hazen Drive, Concord, NH 03301.

Alternatively, you can send a digital image of the plant as an attachment via e-mail to Amy at asmagula@des.state.nh.us.

2007 Legislative Updates

Each year, the Milfoil Study Committee, chaired by Representative Dick Drisko, convenes to discuss potential bills for the upcoming legislative sesion. In the 2007 session, HB 815 was generated, with the aim of targeting out-of-state boaters with an educational campaign to alert them to the problem of exotic aquatic plants. Based on data collected from the Lake Host Program and coordinated by the New Hampshire Lakes Association with DES Prevention Grant Funds, it is estimated that there are well more than 30,000 out-of-state boaters that visit New Hampshire each year. Because many of them come from other nearby states, and could potentially bring in new exotic aquatic plants to New Hampshire, legislators and biologists deemed it critical to attempt to educate this group of individuals about this problem.

In addition to an educational campaign, a $15 user fee was going to be assessed to each out-of-state boater. This fee would have brought in additional revenues to the Exotic Species Program to contribute to the cost of controlling existing infestations of exotic aquatic plants in the state. At this point, only $85,000 is budgeted annually towards exotic plant control, yet requests for funds exceed $230,000 annually.

HB 815 started off strong, with a near unanimous vote in the House committee to which it was assigned. The bill then passed the House Finance Committee, and the vote on the full floor of the House. In the Senate, the bill was reviewed and lauded with a good support base. Unfortunately, when it went to a vote in the Senate committee, the bill was killed.

The Milfoil Study Committee is back in action, and a meeting was just held in late July 2007, with plans for generating some new ideas for legislation for this upcoming session. If you have any ideas about good ideas for legislation or for funding for control practices, please let us know!

Lake Host Program

By Jared Teutsch, President, New Hampshire Lakes Association

The Lake Host Program, established in 2002, is a courtesy education and prevention program designed to be the first line of defense against exotic invasive aquatic plants. Exotic invasive plants such as variable milfoil can seriously compromise the ecological, recreational, and economic value of public waters, as they literally take over a bay, cove, or entire lake.

Through the Lake Host Program, trained paid and volunteer Lake Host staff public motorized boat launch sites to 1) educate visiting boaters about exotic plants; 2) conduct courtesy boat and trailer inspections; 3) show boaters where to look for plant “hitchhikers” and encourage them to self inspect; and 4) send samples of suspicious plants removed from boats to the NH Department of Environmental Services for identification.

Funded through New Hampshire Lakes Association with local, state and federal support, the NHLA Lake Host Program is an excellent example of a successful partnership. Since the start of the Program in 2002, Lake Hosts have inspected over 143,000 boats while recording 135 “saves” of exotic species either entering, or leaving a waterbody. In addition, the rate of the spread of exotic aquatic plans has rapidly declined in New Hampshire. In fact, no new exotic plant infestations have been found in lakes being protected by the NHLA Lake Host Program.

The Lake Host Program is a successful education and prevention program, and combined with the DES volunteer “early detection” Weed Watcher Program, lakes are better prepared to stop the spread of exotic invasive aquatic weeds.

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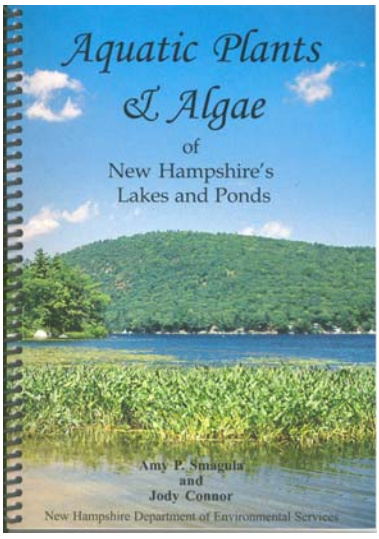
Want to pass this along to a friend? The Weed Watchin' Newsletter can be found online at www.des.nh.gov/wmb/exoticspecies. Just click on the 2007 Newsletter link.

New Plant Identification Resources Available

A new resource for plant identification is now available! At the request of many lake residents and Weed Watchers for more colored photographs and descriptions of aquatic plants, Amy Smagula and Jody Connor collaborated on a new publication entiled *Aquatic Plants & Algae of New Hampshire's Lakes and Ponds*.

This 100-page, full color booklet covers many of the common aquatic plants and algae that are encountered in our lakes and ponds throughout New Hampshire and the Northeast. The books are $5 each, which covers the cost of printing.

To place your order, please call or e-mail Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us with the quantities you would like. Checks should be made payable to "Treasurer, State of New Hampshire," and mailed to NHDES, c/o Amy Smagula, PO Box 95, Concord, NH 03302-0095.



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